

## Comparison of Ciprofloxacin versus Cephalexin and Gentamicin in the Treatment of Multi-drug Resistant Typhoid Fever

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The emergence of multi-drug resistant strains of *Salmonella typhi* (MDRST) is a serious concern for developing countries such as India since culture facilities are not widely available. Though, many epidemics are reported from various parts of our country(1-3), only a few have been reported from Punjab(4,5). The present study compares 2 different regimens in the management of MDRST.

### Material and Methods

Two hundred and ten cases of typhoid fever were studied between January 1990 to September 1991. Blood cultures were done in glucose and bile broths before starting antibiotics. Subcultures were done on blood and MacConkey agar after 24 hours and on

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alternate days for 7 days before discarding. The growth from solid media was identified by biochemical and serological reactions. Antibiotic sensitivity was done by the Kirby Bauer disc diffusion method. After blood culture reports were obtained, a combination of cephaloridine (75 mg/kg/day) 6 hourly IV and gentamicin (6 mg/kg/day) was given in the first 23 MDRST patients (Group I) and ciprofloxacin (10 mg/kg/day orally) in next 23 MDRST cases (Group II). The defervescence was noted after starting therapy and follow up was recorded.

### Results

Out of the 84 blood culture positive cases, 46 (54.76%) were multi-drug resistant (ampicillin, chloramphenicol and cotrimoxazole). Twenty eight (33.33%) cases were sensitive to chloramphenicol and 10 (11.9%) were resistant to chloramphenicol alone or in combination with ampicillin. However, all the cases were sensitive to gentamicin, cephalexin and ciprofloxacin. Thirty two (69.56%) cases were below five- years, and 10 (21.7%) were below the age of 2 years. In Group I, clinical response was seen in only 10 (43.48%) cases and the remaining 13 (56.51) which did not respond by 8 days were given ciprofloxacin - all responded. In Group II all responded to the therapy. The mean duration for defervescence of fever in Group I was 4.7 days as compared to 3.7 days" in Group II. Twenty patients treated with ciprofloxacin were followed up to 8 months and have not shown any complications. Ten cases which responded in Group I had no relapse or any complication. No treatment failure was seen in 28 (33.33%) cases sensitive to chloramphenicol. Ten (11.9%) cases other than MDRST, resistant to chloramphenicol alone or in combination with ampicillin were treated with ciprofloxacin and all responded.

### Discussion

Multi-drug resistant *Salmonella typhi* is causing serious concern country-wide. In the present study, a combination of cephloridine and gentamicin showed poor response (43.48%) despite *in vitro* sensitivity, in contrast to 100% response observed by Koul *et al.*(2). *In vivo* resistance to cephalexin and gentamicin despite *in vitro* sensitivity is known(6). On the other hand, ciprofloxacin was successfully used as first line during in MDRST cases. Similar observations have been reported by various authors(7-9). On follow up to 8 months, this drug did not show any side effects. Although long term follow up is needed, this study shows that ciprofloxacin is a safe and effective form of therapy in MDRST infection.

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## Diazo Test in Typhoid Fever

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Typhoid fever is a major health problem in India. It continues to exist as an endemic

disease due to poor sanitation and low economic status. The emergence of multi-drug resistant *Salmonella typhi* (MDRST) infection has posed many problems relating to diagnosis and therapy. Due to delay

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